

## THE CHARACTERISTICS OF SAGO FROND SAP FROM TWO SELECTED GROWTH STAGES; *ANGKAT PUNGGUNG* AND *UPONG MUDA* PALMS

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**ABSTRACT** Sago frond is produced in abundance upon harvesting of the sago palms for starch extraction, hence need to be utilized and developed into beneficial products. In this study, the sap which contains sugars and starch is obtained by roller crushing the skinned frond for use as fermentation medium. Fronds from two selected growth stages (namely *Angkat panggung* and *Upong muda*) and two different positions within the rosette (inner and outer circle) of the sago palm were studied. Based on the results, the outer circle frond of *Upong muda* palm gave the highest volume of sap at 290mL/kg which equivalent to 1600 mL/frond. On top of that, sago frond sap has an acidic pH, with glucose as major sugar component and contained various kinds of minerals like calcium, potassium and manganese. All fronds from two selected growth stages contain glucose between 28-68 g/L and xylose 21-29 g/L, respectively. After 21 days of storage, it can be concluded that the amount of reducing sugars and starch in most samples obtained from two selected growth stages decreased slightly from the original. Subsequently after this study, both fresh and stored sago frond sap can be used as a fermentation substrate without any pre-treatment or modification.

**Keywords:** *Angkat panggung*, fermentation, starch, sugar, *Upong muda*.

### 1. INTRODUCTION

Sago is one of the important commodities which contribute to the economic value in our countries. In Malaysia, the state of Sarawak has the largest sago plantation area which is about 54,000 hectares (DoS, 2015). Bujang (2014) pointed out that the sago palm is the only commodity that able to grow in peat soil which occupies around 75% of coastal plains and lowland river basins in Sarawak. The growth of sago palm on humid peat soil reduces farmland competition with

other crops which makes sago palm better than other cash crops. Nowadays, the starch made from sago are marketable and provide a regular cash flow to the sago farmers. However, sago palm takes years, up to ten years to reach maturity stages before harvested (Bujang, 2014). Throughout the maturation period, farmers have to wait up to ten years to earn income from the harvested sago palm. As one of the potential biomass, the utilization of sago frond can provides benefits to sago farmers and generate new passive income for them in a short time.